

ABSTRACT

5 A UV air cleaning and disinfecting system has an enclosed chassis with an inlet/outlet
surface panel on one planar side thereof, and the chassis is mounted in the space behind a drop
ceiling with its surface panel coplanar with the ceiling surface and facing into the room space. The
surface panel has a pair of inlet vent arrays on opposite longitudinal sides of the surface panel from
each other, and a pair of outlet vent arrays on opposite latitudinal sides of the surface panel from
each other. Arranged in the chassis are an air blower unit and an array of UV lamps. The
10 positioning of the inlet and outlet vent arrays establish four mutually circulating air streams in a four-
leaf-clover pattern in the room space, which obtains a high-efficiency throughput of air handled by
the system. The UV lamp array is arranged longitudinally across the chassis between the inlet
vents at a lower elevational position of the chassis. A pair of air filters is arranged at intake chambers
separated by UV-blocking baffles at opposite longitudinal sides of the main chamber housing the
15 air blower in the center of the chassis at an upper elevational position from the array of UV lamps.
The upward and downward movement of the air through the filters and over the UV lamps toward
the center causes swirling movements which enhance the exposure of pathogens in the air to UV
radiation exposure. The surface panel is formed with a series of cascading door sections to allow
wide access across the center of the chassis for maintenance of the UV lamps, with a first door
20 section connected to an interlock switch for cutting off electrical power to the UV lamps and fan
when the first door section is opened. The UV-blocking baffles have an angled shape and slits at
an upper flange thereof covered with fused silica shields. The system's chassis is dimensioned to
fit on ceiling rails spaced at standard 4 foot length and 2 foot width intervals. The system can
provide 99% or higher inactivation of pathogens in the air with 2 to 7 or more air changes per hour
25 for standard sized rooms.